MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

HMM1011 – BASIC MICROBIOLOGY

(All Sections / Groups)

3 MARCH 2017
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question Paper consists of 7 pages with **5** questions only.
2. Attempt **ALL** the questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the space provided in this Question Paper.

QUESTION 1

a) Some bacteria are considered pleomorphic. What does it mean? [1 mark]

b) In the use of the 100x objective lens of a compound light microscope, what would occur if water were accidentally applied in place of immersion oil? [1 mark]

c) Why are microorganisms hard to be seen in wet preparations? [1 mark]

d) What is a plasmid? Why are plasmids important to the genetics of many bacteria? [2 marks]

e) What are capsule and slime layer? What are their roles (name at least TWO)? [3 marks]

f) Fill in the blanks: [2 marks]

It was once believed that life could come from nonliving things, such as mice from corn, flies from bovine manure, maggots from rotting meat, and fish from the mud of previously dry lakes. John Needham in 1745 validated heated nutrient broth was soon growing microorganisms, his theory was called _____.

Rudolf Virchow in 1858 challenged the theory of John Needham's with a theory called _____. This concept claims that living cells can arise only from preexisting living cells. Virchow defended this concept to the scientific community but he did not come up with a convincing experiment to back up his idea.

In 1861, the French scientist _____ resolved the issue on the origin of microbes through a series of ingenious and persuasive experiments. With the use of _____ flasks that he designed, Pasteur demonstrated that life does not arise in areas that have not been contaminated by existing life.

Continued...

QUESTION 2

a) Why is agar preferable to gelatin as the solidifying agent in culture media? [1 mark]

b) How could you determine whether the turbidity in your nutrient broth tube was from a mixture of different microbes or from the growth of only one kind of microbe? [2 marks]

c) A pastry chef accidentally inoculated a cream pie with six *Staphylococcus aureus* cells. If *S. aureus* has a generation time of 60 minutes, how many cells would be in the cream pie after 7 hours? [2 marks]

d) Identify a situation that pathogens find it advantageous to form biofilms? [1 mark]

e) Organisms can be categorized into 4 groups according to their nutritional pattern. Almost all medically important microbes belong to which of the groups? [1 mark]

f) If antibiotics can harm cells, how can we use them in the human body? [1 mark]

g) How do salts and sugars preserve foods? How do you explain for the occasional growth of *Penicillium* mold in jelly, which is 50% sucrose? [2 marks]

Continued...

QUESTION 3

a) Viruses are infectious particles about 100 times smaller than bacteria and can only be observed by electron microscopy. Describe the general structure of a virus. [2 marks]

b) Contrast viroids and prions, and for each name a disease it causes. [2 marks]

c) Describe FOUR features of a fungus. [2 marks]

d) Name FOUR diseases caused by protozoa. [2 marks]

e) Assume you see an arthropod on your arm. How will you determine whether it is a tick or a flea? [1 mark]

f) Most nematodes are dioecious. What does this term mean? [1 mark]

Continued...

QUESTION 4

a) Define Epidemiology [1 mark]

b) What did people in the 1600s believe about miasma? [1 mark]

c) Differentiate the terms in each of the following pairs:

i. Etiology and pathogenesis [1 mark]

ii. Infection and disease [1 mark]

iii. Communicable disease and noncommunicable disease [1 mark]

Continued...

d) Of all the hospital patients with infections, one-third do not enter the hospital with an infection. How do they acquire these infections? What is the method of transmission of these infections? What is the reservoir of infection? [3 marks]

e) Ignaz Semmelweis is known as an early pioneer of antiseptic procedures. He was called "the savior of mothers". What did he do to bring him the glory? [2 marks]

Continued...

QUESTION 5

a) Identify one physical factor and one chemical factor that prevent microbes from entering the body through skin. [1 mark]

b) Summarize the major outcomes of complement activation. [3 marks]

c) Explain why a person who recovers from a disease can attend others with the disease without fear of contracting it. [1 mark]

d) Describe briefly THREE conditions that create opportunities for pathogens to become harmful to humans. [3 marks]

e) Will a person die of *E. coli* infection after an intestinal puncture? Explain your answer. [2 marks]

End of Paper